

Workshop on Planetary Protection Knowledge Gaps for Human Extraterrestrial Missions

March 24-26th, 2015; NASA Ames Research Center, CA

FINAL ANNOUNCEMENT — FEBRUARY 2015

Institutional Support:

National Aeronautics and Space Administration
NASA Ames Research Center
SETI Institute
Universities Space Research Association

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MEETING LOCATION AND DATE

NASA's Ames Research Center and SETI Institute will co-host a Workshop on Planetary Protection Knowledge Gaps for Human Extraterrestrial Missions on March 24 – 26, 2015 in Moffett Field, CA. The workshop will take place in Building 152 in the NASA Research Park (NRP).

Further details and map can be located here:

<http://www.nasa.gov/ames/ppw2015workshop>

PURPOSE AND SCOPE

During the course of planetary exploration, internationally recognized planetary protection measures have been developed and are in place to prevent confounding the search for life on Mars and to safeguard Earth from the return of potentially hazardous material. Since the close of the Apollo program, planetary protection practices have not been necessary for crewed missions and little consideration was given to planetary protection in human system design and development. With preparations underway for exploration beyond low Earth orbit, including NASA's development of the Space Launch System (SLS) and Orion capsule, planetary protection must once again be considered and incorporated in system design. Space suits, habitat modules, and in-situ resource utilization (ISRU) equipment are just a few of the systems that will need to address planetary protection requirements and guidelines in their design, development, and operations.

While planetary protection requirements are in place for robotic missions, there is presently insufficient scientific, technological, and operational knowledge to establish detailed quantitative requirements for the development of crewed spacecraft and missions, while respecting planetary protection policy objectives. To prepare for such future missions, NASA has created the *NASA Policy on Planetary Protection Requirements for Human Extraterrestrial Missions* (NPI 8020.7) which outlines the need to increase knowledge in the following study areas while iteratively developing an appropriate set of requirements:

- Study Area 1: Microbial and human health monitoring
- Study Area 2: Technology and operations for contamination control
- Study Area 3: Natural transport of contamination on Mars

The goal of this workshop is to capture the current state of knowledge in these areas and identify additional research to appropriately inform planetary protection requirements for the human exploration of Mars in line with current planetary protection policy objectives. The information collected at this workshop, in addition to information collected from literature review and previous planetary protection workshops, will enable NASA to efficiently conduct studies that will define the initial set of planetary protection requirements for human missions.

MEETING THEMES

To capture the current state of knowledge appropriate to planetary protection and future human missions, the following themes under each of the three main study areas are being sought for review and discussion:

- Study Area 1: Microbial and human health monitoring
 - Monitoring growth and survival of human & habitat associated microbial populations in space environments
 - Minimal mass/volume and low consumable/waste product biological assay techniques
 - Microbiome research and the ability to detect extraterrestrial perturbations
 - Crew quarantine measures for preventing back contamination
 - Crew health and habitat microbiome impacts from Mars material exposure
- Study Area 2: Technology and operations for contamination control
 - Cleaning, sterilization, re-contamination prevention, and associated verification technologies for in-situ application
 - Environmental Control and Life Support (ECLS) loop closure and mitigation of spacecraft effluents
 - Technologies for contamination control of human surface mobility systems and spacesuits
 - Contamination control and preventing creation of localized habitable environments by support systems (In-situ Resource Utilization (ISRU), power, etc.)
 - Human surface exploration operational strategies for mitigating contamination
 - Sample acquisition, containment and breaking-the-chain (BTC) of contact technologies
 - Environmental clean-up of inadvertent release of unsterilized terrestrial material
- Study Area 3: Natural transport of contamination on Mars
 - Transport of biological contamination
 - Transport of organic contamination (particulates and molecular)

Additional study areas and themes related to planetary protection requirement development for human missions may be discussed in the proposed workshop breakout sessions.

MEETING FORMAT

The workshop will open with a brief review of the goals and scope for the workshop and NASA's current perception of knowledge gaps and suggested studies. The meeting will then proceed with oral presentation of accepted abstracts in one main plenary session covering each of the main study areas and their corresponding themes. The workshop will conclude with working breakout sessions focusing on each identified study area. The full program agenda is viewable at:

http://www.hou.usra.edu/meetings/ppw2015/Program_with_Abstracts.pdf

After reviewing the workshop agenda and abstracts received, the organizers have elected to not hold a virtual pre-meeting. The topics that would have been presented at such a virtual pre-meeting will be covered within the first several hours of the workshop. It is strongly encouraged that attendees be present for the start of the workshop at 8:00 a.m. PT on Tuesday, March 24, 2015, in order to be fully prepared for discussion during the workshop's breakout sessions on Thursday, March 26.

VIRTUAL PARTICIPATION

Virtual attendance of the main plenary sessions will be available via Adobe Connect. This connection will provide both video and audio of the main workshop events and enable interaction during Q & A periods through the monitored chat room:

<https://ac.arc.nasa.gov/planetaryprotection/>

INFORMATION FOR PRESENTERS

Oral Presentation Content —

Each presenter is allocated 20 minutes for their presentation, inclusive of a 2-5 minute period for Q & A. Any deviations from this allocation must be coordinated with the session chairs and workshop organizer. To prepare for the breakout sessions at the end of the workshop, it is requested that each presentation attempt to highlight what knowledge still needs to be collected within the assigned study area to inform future planetary protection requirements. Further guidance may be provided by e-mail in advance of the workshop. Please note it is the responsibility of the presenter to fulfill any export control requirements for their presentation. Foreign nationals are expected to be in attendance.

Oral Presentations —

A PC laptop, LCD projector, and speaker remote will be available for the presentation of abstracts during each main study area session. In order to facilitate a smooth transition between speakers, all presentations will be preloaded and tested in advance. To aid the preloading process, create a folder on a flash drive/CD called "PPW2015" and place your

PowerPoint presentation in that folder. Please include your last name in the naming of your presentation file. An IT technician will be available each morning from 8:00 to 8:30 a.m. to assist in loading your talk from the flash drive/CD you provide.

Hardware and Software Specifications —

The plenary room will be equipped with the following minimum hardware and software:

PC Hardware:	PC Software:
iMac 27-Inch Mid 2011 Intel Core i5, 2.7 GHz AMD Radeon HD 6770M 512 MB	Operating System: OSX Version 10.8.5
Memory: 4 GB RAM	Microsoft Office 2010 (including PowerPoint 2010)
Video: 2560 x 1440	Internet Explorer 10, Windows Media Player 12, QuickTime 7, Adobe Acrobat Reader XI, FireFox 32

REGISTRATION

No registration fees are being collected for this workshop, however registration is required for planning purposes. To access forms and instructions for registration, please visit <http://hou.usra.edu/meetings/ppw2015>. **Registration closes Tuesday, March 10, 2015.**

ACCOMMODATIONS

Hotel rooms in the Ames vicinity book up quickly! A block of rooms at the NASA Ames Exchange Lodge have been reserved for attendees of the workshop and will be held until February 27, 2015.

If you are interested in accommodations within the NASA Research Park, which is within walking distance of the venue, at exceptionally reasonable prices, please call (650) 603-7100 for availability and further information. Let them know that you are attending this workshop when making a reservation.

DIRECTIONS

Directions to the meeting location may be located at the host center's website: <http://www.nasa.gov/ames/ppw2015workshop>

CONTACTS

For further information regarding the content and details of this workshop:

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SCHEDULE

Pre-Registration Deadline	Monday, February 23, 2015
Registration Closes	Tuesday, March 10, 2015
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